

Project Report: GenHelp - An Educational Game

Project: GenHelp - Sexual Health Education Game **Team:** TechCube **Date:** October 20, 2025

1. Introduction of the Game

"GenHelp" is an interactive, web-based educational game designed to provide teenagers (ages 13-18) with essential knowledge about sexual health, mental wellbeing, and healthy relationships. The game combines engaging board game-style mechanics with a dynamic quiz system and chance-based elements. Players select a character, roll a dice to move 1-6 spaces along a linear path through a 15x8 grid maze, encountering two types of special tiles:

- Yellow Quiz Tiles:** Present multiple-choice questions on sexual health topics, rewarding correct answers with +10 points and penalizing incorrect answers with -5 points (score never goes below 0).
- Purple Event Tiles:** Trigger an animated Wheel of Fortune that randomly awards or deducts points (-15 to +25), adding an element of excitement and unpredictability.

The core objective is to make learning about sensitive and critical life topics accessible, non-judgmental, and engaging. By gamifying the educational experience through board game mechanics familiar to young people, "GenHelp" aims to break down the barriers of stigma and discomfort, empowering players to learn at their own pace in a safe, private environment. The game features a comprehensive scoring system, a persistent leaderboard stored locally, and character selection to encourage personalization and replayability.

A key innovation in this project is the integration of a dynamic AI-powered quiz generation system using the Google Gemini API, allowing for a virtually endless supply of fresh, relevant, and age-appropriate questions beyond the 24 carefully curated baseline questions.

2. Game Theme & Topic Justification

The theme of "GenHelp" centers on sexual health education, mental wellbeing, consent, and healthy relationships. This topic was deliberately chosen for several critical reasons:

- Critical Knowledge Gap:** Teenagers are at a developmental stage where they begin to make significant decisions about their bodies, relationships, and health. However, comprehensive, accessible, and non-judgmental educational resources are often lacking or inconsistent across schools, families, and communities.
- Stigma and Discomfort:** Discussing topics like pregnancy prevention, contraception, STIs (Sexually Transmitted Infections), consent, and body autonomy can be uncomfortable for teens, parents, and even some educators. A game provides a private, low-pressure medium to explore these subjects without fear of judgment or embarrassment.
- Empowerment Through Knowledge:** Accurate information is a tool for empowerment. By understanding topics like body autonomy, consent, mental health resources, and STI prevention, teenagers are better equipped to make safe, informed decisions, set healthy boundaries, and seek help when needed.
- Holistic Approach:** The game intentionally links sexual health with mental wellbeing and peer pressure resistance. This reflects the reality that emotional health, stress, self-esteem, and social dynamics are deeply intertwined with relationship decisions and choices about sexual health.
- Preventative Education:** Providing this knowledge early can have a significant preventative impact, reducing rates of unintended pregnancies and STIs, and promoting a culture of consent and mutual respect from a young age.
- Engaging Format:** By using board game mechanics (dice rolling, path progression, chance elements) combined with educational content, the game makes learning fun and memorable, increasing retention of critical health information.

3. Potential Impact

The "GenHelp" game has the potential to make a significant positive impact on its target audience and the broader community:

- Increased Health Literacy:** By presenting factual, medically accurate information in an engaging board game format with immediate feedback and educational explanations, the game can significantly improve teenagers' understanding of critical health topics (pregnancy prevention, STI awareness, consent, mental health resources), leading to healthier behaviors and outcomes.
- Normalization and Reduced Stigma:** The game normalizes conversations about sexual and mental health in a private, judgment-free environment, helping to reduce the stigma that often prevents young people from asking questions or seeking support from trusted adults or healthcare providers.
- Promotion of Consent Culture:** With consent and healthy boundaries as core topics, the game actively contributes to building a culture of respect and clear communication, which is fundamental to preventing sexual assault and fostering healthy relationships based on mutual respect.
- Scalable and Accessible Education:** As a lightweight, web-based application requiring no downloads or installations, the game is highly accessible to anyone with an internet connection and a browser (desktop or mobile). The AI-powered quiz system ensures the content remains fresh and can be scaled indefinitely without manual content creation, while the 24 curated baseline questions ensure reliability.
- A Tool for Educators and Parents:** The game can serve as a valuable supplementary tool for health educators in schools, youth programs, and healthcare settings. It also provides a conversation starter for parents, offering a structured and engaging way to introduce and discuss sensitive topics with their teenagers.
- Empowerment and Agency:** By learning about their rights, their bodies, mental health resources, and the support systems available to them, players gain a sense of agency and are more likely to advocate for their own health and wellbeing, make informed decisions, and seek help when needed.
- Replayability for Mastery:** The combination of randomized dice rolls, the Wheel of Fortune element, AI-generated questions, and the leaderboard system encourages multiple playthroughs, reinforcing learning through repetition in a way that remains engaging rather than tedious.

4. Technology Stack

The project leverages a modern, lightweight, and powerful technology stack focused on frontend capabilities and direct API integration, with no backend server required.

Frontend Technologies

- **HTML5:** Provides the semantic structure for all game screens (menu, character selection, game board, quiz modals, leaderboard) and UI components. Clean, accessible markup ensures compatibility across browsers and devices.
- **CSS3:** Used for all styling (~1,100 lines), including:
 - **CSS Grid Layout:** For the 15x8 maze grid structure and responsive layouts
 - **Glassmorphism Effects:** Modern frosted-glass aesthetic with backdrop filters for modals and UI panels
 - **Pastel Color Palette:** Soft, welcoming colors designed to reduce anxiety around sensitive topics
 - **Animations:** Smooth transitions for dice rolling, Wheel of Fortune spinning, player movement, and UI interactions
 - **Responsive Design:** Fully functional on desktop, tablet, and mobile devices
- **JavaScript (ES6+):** The core of the project (~850 lines in script.js), handling:
 - Game logic (board state, path generation, tile tracking)
 - Dice rolling mechanics with random number generation
 - Player movement and collision detection
 - Quiz system (question presentation, answer validation, scoring)
 - Wheel of Fortune animation and point calculation
 - State management and game flow control
 - DOM manipulation for dynamic UI updates
 - Leaderboard sorting and display

AI Tools & Services

- **Google Gemini API:** The cornerstone of the dynamic content system. Used to generate an endless supply of educational, age-appropriate quiz questions on demand beyond the 24 curated baseline questions. Features include:
 - Sophisticated system prompt acting as guard rails for content safety
 - Frontend content moderation filtering inappropriate keywords
 - Fallback system that seamlessly reverts to curated questions if AI generation fails
 - JSON-based structured output for seamless integration
- **GitHub Copilot:** Utilized throughout the development process for code generation, autocompletion, debugging assistance, documentation generation, and suggesting optimal implementations, significantly accelerating development time and code quality.

Web Libraries & APIs

- **Web Audio API:** Generates all in-game sound effects dynamically in the browser without requiring any external audio files, keeping the application lightweight (< 1 second load time). Includes sounds for:
 - Dice rolling
 - Player movement
 - Correct/incorrect quiz answers
 - Wheel of Fortune spinning
 - Victory celebration
- **Fetch API:** Communicates directly with the Google Gemini API from the frontend to retrieve AI-generated quizzes in real-time, eliminating the need for a backend server.
- **localStorage:** Provides client-side persistent storage for the leaderboard, maintaining top scores across browser sessions without requiring user accounts or a database.

Development & Assets

- **SVG Graphics:** 6 character sprite images (< 15 KB total), ensuring fast loading and crisp rendering at any resolution
- **Code Organization:** Modular file structure with separated concerns:
 - `script.js` - Main game logic
 - `gemini-quiz.js` - Quiz questions and AI integration
 - `config.js` - Configuration and API key management
 - `api-integration.js` - Future backend integration preparation
 - `style.css` - Complete UI styling

Project Statistics

- **Total Lines of Code:** ~2,200+ (HTML, CSS, JavaScript)
- **Curated Educational Questions:** 24 high-quality baseline questions
- **Maze Dimensions:** 15x8 grid (120 tiles total)
- **Quiz Tiles:** 5 strategically positioned along the path
- **Event Tiles:** 6 Wheel of Fortune tiles for chance-based gameplay
- **Browser Support:** Chrome, Firefox, Safari, Edge, and mobile browsers
- **Load Time:** < 1 second on standard connections

5. Overview of Game Mechanics

The gameplay loop is designed to be simple, intuitive, and educationally effective, combining familiar board game mechanics with interactive learning.

Game Flow

1. **Start & Setup:**
 - Player enters their name on the menu screen to personalize the experience
 - Player selects one of 6 character avatars (diverse representation)
 - Game initializes the 15x8 grid maze with a linear path from start to trophy goal
2. **Dice Rolling & Movement:**
 - Player clicks the "Roll Dice" button to generate a random number from 1-6

- Character automatically moves that many spaces along the predetermined path
- Smooth CSS animations provide visual feedback during movement

3. Yellow Quiz Tiles - Educational Encounters:

- 5 quiz tiles are strategically positioned along the 15-tile path
- When the player lands on a yellow quiz tile, the game pauses and a modal appears
- Modal displays a multiple-choice question with 4 possible answers
- **Player Interaction:**
 - **Correct Answer:** +10 points, positive sound effect, educational explanation of why the answer is correct
 - **Incorrect Answer:** -5 points (score never drops below 0), corrective sound, detailed explanation of the correct answer and why
- Educational explanations appear regardless of answer, reinforcing learning
- Player clicks "Continue" to resume gameplay after reading the explanation

4. Purple Event Tiles - Wheel of Fortune:

- 6 event tiles are scattered throughout the path
- When the player lands on a purple tile, an animated Wheel of Fortune appears
- The wheel spins with smooth CSS animations and sound effects
- Random outcome awards or deducts points ranging from -15 to +25
- Adds excitement, chance, and replayability to the experience
- Score protection ensures the total never drops below 0

5. Scoring System:

- Score starts at 0 and increases/decreases based on quiz answers and wheel spins
- **Scoring breakdown:**
 - Correct quiz answer: +10 points
 - Incorrect quiz answer: -5 points
 - Wheel of Fortune: -15 to +25 points (random)
 - Minimum score: 0 (never negative)
- Score is displayed in real-time in the game UI header

6. Goal & Victory:

- The objective is to reach the trophy tile at the end of the linear path (position 15)
- Upon reaching the goal, a victory modal appears with:
 - Celebration sound effect
 - Final score display
 - Option to view the leaderboard
 - Option to play again

7. Leaderboard System:

- Top 10 scores are saved persistently using localStorage
- Leaderboard displays player names and scores in descending order
- Provides motivation for replay to achieve higher scores
- No user accounts required - all data stored client-side

Educational Design Principles

- **Immediate Feedback:** Players instantly learn whether their answer was correct and receive explanations
- **Non-Punitive Learning:** Wrong answers result in minimal point deduction and provide corrective information rather than harsh penalties
- **Scaffolded Learning:** Questions cover a range of topics (pregnancy prevention, STI awareness, consent, mental health) to build comprehensive knowledge
- **Gamification for Engagement:** Board game mechanics and scoring systems make learning feel like play rather than a test
- **Replayability:** Random dice rolls, Wheel of Fortune outcomes, AI-generated questions, and leaderboard competition encourage multiple playthroughs for mastery

6. Reflection

The development of "GenHelp" was a journey of both technical implementation and thoughtful content design, requiring careful consideration of educational effectiveness, user safety, and engagement mechanics.

Key Challenges & Solutions

1. AI-Powered Quiz Generation Safety: The biggest challenge and most significant achievement was implementing AI-powered quiz generation while ensuring absolute content safety for a teenage audience. Ensuring the content generated by Gemini was safe, age-appropriate, medically accurate, and non-judgmental was paramount. This was addressed by creating a robust, multi-layered safety system:

- **System Prompt Guard Rails:** A highly detailed system prompt instructs the AI to generate questions appropriate for ages 13-18, medically accurate, non-judgmental, and educational rather than sensational
- **Frontend Content Moderation:** Filters the AI's output for inappropriate keywords, slang, and ensures questions contain educational value before display
- **Fallback System:** Seamlessly reverts to a set of 24 high-quality, manually curated questions if the AI fails to generate suitable content for any reason
- This hybrid approach ensures a reliable and safe user experience while still harnessing the power of generative AI for dynamic, varied content

2. Balancing Education and Engagement: Creating a game that is simultaneously educational and fun required careful balance. The solution was implementing dual mechanics:

- **Quiz tiles** provide structured learning with immediate feedback and explanations
- **Wheel of Fortune tiles** inject unpredictability and excitement, breaking up the educational content
- **Score protection** (never dropping below 0) prevents discouragement while maintaining stakes
- **Dice rolling** familiar from board games makes the experience approachable and low-pressure

3. Reducing Stigma Through Design: Visual design choices were deliberately made to create a welcoming, non-threatening environment:

- **Pastel color palette** creates a soft, calming aesthetic rather than clinical or intimidating
- **Glassmorphism effects** provide a modern, approachable visual style popular with teens
- **Character selection** allows for personal expression and representation
- **Private gameplay** (no social sharing required) allows learning without fear of judgment

Technical Achievements

- **Zero-dependency frontend architecture:** Entire game runs in the browser with no backend, making it highly portable and easy to deploy
- **Lightweight performance:** < 1 second load time despite rich animations and interactive features
- **Web Audio API mastery:** All sound effects generated procedurally in browser, eliminating file downloads
- **Responsive design:** Fully functional across desktop, tablet, and mobile devices
- **Modular code architecture:** Clean separation of concerns allows for future expansion

Educational Impact & Lessons Learned

Throughout development, the team learned that effective sexual health education for teenagers requires:

- **Meeting them where they are:** Using game mechanics they already understand (board games, dice rolling) rather than complex interfaces
- **Privacy and safety:** Creating a judgment-free space where they can learn at their own pace without social pressure
- **Accuracy without alarmism:** Providing factual, medically accurate information presented in an age-appropriate, empowering way
- **Repetition through engagement:** Encouraging multiple playthroughs through gamification rather than forcing repetition

Future Expansion Possibilities

While the project successfully meets its current goals as a standalone educational tool, the architecture allows for future enhancements:

- **Backend Integration:** The `api-integration.js` file, though currently unused, could be reactivated to connect to a backend for features like:
 - Global leaderboards across all players
 - User accounts with progress tracking
 - Analytics to identify which topics need more educational focus
 - Multiplayer or collaborative learning modes
- **Content Expansion:** Additional quiz categories (e.g., healthy eating, substance awareness, digital safety)
- **Accessibility Features:** Screen reader support, keyboard-only navigation, text-to-speech for questions
- **Localization:** Multi-language support to reach broader audiences

Conclusion

"GenHelp" successfully demonstrates that sensitive, critical health education can be delivered through engaging, game-based experiences. By combining thoughtful educational design with modern web technologies and AI-powered content generation, the project creates a scalable, safe, and impactful tool for empowering teenagers with essential knowledge about sexual health, consent, and mental wellbeing. The project stands as proof that technology can break down barriers to education and create judgment-free spaces for young people to learn about topics that are too often shrouded in stigma and silence.

Project Metrics:

- **Development Time:** RMIT Hackathon 2025
- **Team:** TechCube
- **Lines of Code:** ~2,200+ (HTML, CSS, JavaScript)
- **Educational Questions:** 24 curated + unlimited AI-generated
- **Target Audience:** Teenagers ages 13-18
- **Deployment:** Web-based, no installation required
- **Technologies:** HTML5, CSS3, JavaScript ES6+, Google Gemini API, Web Audio API, localStorage

Made with: GitHub Copilot, Google Gemini API, and Web Audio API